5)

At least three edges meet at each vertex, so $v_1 = v_2 = 0$, and

$$v = v_3 + v_4 + \cdots$$

Each face has at least three sides, so $f_1 = f_2 = 0$, and

$$f = f_3 + f_4 + \cdots$$

Counting the edges per vertex over counts the edges by a factor of two since each edge meets two vertices. Hence

$$2e = 3v_3 + 4v_4 + \cdots$$

Similarly, counting the edges per face over counts the edges by a factor of two since each edge belongs to two faces.

$$2e = 3f_3 + 4f_4 + \cdots$$

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